

SECTION 6000

IMPLEMENTATION AND TECHNOLOGY TRANSFER

6100 Implementation of Research Findings

6200 Implementation Policy

6300 Implementation Responsibility

- 6310 Principal Investigator
- 6320 Program Manager
- 6330 Functional Managers

6400 Implementation Methods

- 6410 Spreading the Word
- 6420 Implementing Research Findings
- 6430 How to Prepare Implementation Plans

6500 Technology Transfer (T²)

- 6510 General Information
- 6520 Caltrans Technology Transfer Coordinator
- 6530 Administering Technology Transfer
- 6540 Responsibilities of Offices within Headquarters

6600 Implementing Program Peer Review

- 6610 Program Peer Review Definition
- 6620 Performance Responsibility
- 6630 Implementation of Review Results

SECTION 6000

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6100 Implementation of Research Findings

Implementation is a crucial last stage in the research process. Implementation is the incorporation of the results into the everyday practices of the organization; it's adding a new tool to the tool box. No matter how brilliantly conceived, masterfully conducted, meticulously documented, superbly analyzed, or eloquently discussed, the research is of little importance if it is not implemented. The researcher can and must play a leading role in the implementation of research findings.

6200 Implementation Policy

It is the policy of the Department to incorporate valid and appropriate research findings into the Department's operations as rapidly as possible. Implementation may include a new or revised procedure, standard, design, specification, test method, computer program, or manual change. It may also include the development, commercialization, and use of new products including new kinds of equipment.

6300 Implementation Responsibility

6310 Principal Investigator

It is the responsibility of the principal investigator on a research project to present research findings in a usable form and, where appropriate, to make recommendations on how these findings may be implemented.

Contact with other state departments of transportation may be helpful to learn about their experiences with similar research projects and implementation of the findings. The principal investigator must also work with the Office of Pavement and Research Management Implementation Coordinator to develop the most suitable mechanism for incorporating the changes into the Department. This may include a marketing brochure, a training class or a users manual.

6320 Program Manager

The Program Manager responsible for accomplishing a given research project also bears primary responsibility for evaluating completed research and placing it in proper context with operations. The

Program Manager is usually qualified to recommend any methods or approaches to use to achieve incorporation of the findings into Departmental operations.

All research final reports, including films and videotapes (as well as interim reports with specific findings) as discussed in Section 5000, are to be approved and transmitted by the Program Manager to the Office of Pavement and Research Management.

This transmittal memorandum should state what was found in the study, what the findings mean to the operations of the Department, how the findings should be implemented by the Department or other organizations, and recommended procedures for implementation and expected benefits.

In addition, an "Estimate of Research Project Cost and Savings" must be attached to the transmittal to the Office of Pavement and Research Management; see Section 5600 for more information.

6330 Functional Managers

The functional managers for the various functions, such as materials, traffic safety or hydraulics, are responsible for reviewing and approving research reports originating within their functional area, and for arranging for the dissemination of these reports. Those same managers are responsible for implementing research findings within their own area within the Department.

6400 Implementation Methods

6410 Spreading the Word

Although the final report documents the entire project in detail, it should not represent the final effort of the research. Often it is not appropriate for promoting any required change of methods, policies or operational procedures. For complete implementation managers and supervisors must support the project recommendations. Maintenance and construction workers may need training in new procedures and the reasons behind changes that are forcing them to shift out of comfortable habits. See Section 5000, Documentation and Presentation of Research Findings, for a variety of methods to orient potential users about the research findings.

The researcher is often the best qualified source for preparing a training class, slide presentation, user's manual, or executive report. The researcher is most familiar with the research and the background, has built up momentum on the project, and usually has a personal interest in seeing the hard work put to good use. Thus, the researcher should include these activities in the research proposal during the

planning and preparation process or as a separate effort later, after completion of the actual research, as an Implementation Plan. The researcher should confer with the end user about effective modes of presentation, coordinate with the Office of Pavement and Research Management, and then promote the use of any recommended aids in the Implementation Plan. This should be completed as soon as possible in order to expedite implementation.

6420 Implementing Research Findings

One of the key means of implementing research findings is through the incorporation of new or revised standards into Caltrans day to day operations. These include Caltrans specifications, plans, test methods, and manuals. A draft of these new standards should be included in the final report. In some cases, the new standard may be adopted before the final report is published. Then the approved standard should be included in the report and clearly labeled as such. Actual incorporation of the new material may still require an Implementation Plan; see Section 6430.

Whenever new standards are adopted, the researcher should request the opportunity to review any later changes made in the proposed standards. This is to ensure that the standards prepared have interpreted the research findings correctly and not introduced any new problems. Although the functional user would normally be expected to be responsible for these standards from this point on, the conscientious researcher will check on the subsequent progress and changes in the standard.

6430 How to Prepare Implementation Plans

Program staff should work with the Office of Pavement and Research Management to develop Implementation Plans for research projects completed by or for the Department which are considered to have potential for statewide or nationwide implementation.

The content and purpose of an Implementation Plan is to provide the potential users with documentation of the research project and enable them to become sufficiently familiar with and understand the research findings for implementation. It should also provide the potential user with the confidence required to accomplish implementation. The Implementation Plan, in essence, is a sales tool to encourage implementation. The Plan may result in a pamphlet, motion picture, slide presentation, users manual, applications brochure, training class or any combination of these formats.

The Implementation Plan is considered to be an effort within the research project. Each plan should provide a brief statement of the research to be implemented, description of the techniques to be used, personnel to be used, breakdown of cost, and the approximate time duration of the effort. Funding for this type of activity may come from

the research project budget. At the conclusion of each Implementation Plan, a brief report outlining the individual effort and its results should also be prepared and submitted together with a copy of the project final report to the Chief, Office of Pavement and Research Management.

An Implementation Plan should include sufficient information about the research so prospective users can incorporate the new concept into their operations. It must be presented in a clear concise manner. It should provide a brief synopsis of the research problem and objectives, the nature and significance of the accomplishments, and an explanation why their adoption and use represents an improvement over existing practices. Also, an indication of what changes are called for in new or modified equipment or methods, materials, quality control techniques, or procedures is required.

Additional desirable information includes:

- A contact person for questions concerning use of the new concept, and any rules or guides that will expedite incorporation.
- Estimates of the monetary benefits, or other positive values, achieved by such implementation.
- Evidence that the product of the research has been effective in real world operations.
- When revision of existing operations is necessary, the Implementation Plan should provide guidance or examples in three key areas:
 - design criteria, procedures or practices,
 - specifications, and
 - construction procedures or practices.

6500 Technology Transfer (T2)

6510 General Information

Technology Transfer normally refers to the process by which existing research knowledge of others (outside of Caltrans) is transferred operationally by the Department into useful processes, products, or procedures. However, Technology Transfer can also involve the advancement and promotion of implementation of Caltrans' own research results.

6520 Caltrans Technology Transfer Coordinator

In order to improve the Department's handling of Technology Transfer and to complement the FHWA's efforts in that regard, a Caltrans Technology Transfer Coordinator has been designated within the Office of Resource Conservation (FHWA Technology Applications

Branch) as the principal contact with the FHWA on all matters of Technology Transfer in implementation areas as well as construction evaluated projects and technology application projects.

6530 Administering Technology Transfer

The Caltrans Technology Transfer Coordinator is responsible for activities associated with items to be disseminated both within the Department and to local agencies within the State and for reporting on implementation and achievements obtained by the Department. The primary duties are to:

- Review Technology Sharing Reports and other implementation tools and forward them to appropriate Program Offices for review and implementation. Comments are required on how implementation will be accomplished or why the recommendations will not be implemented. Action is reported back to FHWA or other initiating agency.
- Notify the Office of Local Assistance which in turn alerts the District Local Assistance Engineers of the availability of the report results, Implementation Packages, National Highway Institute courses and workshops, and make them aware of potential interest coming from local agencies within their Districts.
- Coordinate and administer the FHWA Local Technical Assistance Program (LTAP) activities being carried on by the T² center at the Institute of Transportation Studies, University of California, Berkeley. This is a concerted effort to transfer new technology to local agencies through a newsletter, training workshops, and library assistance.
- Serve as coordinating unit liaison with FHWA in connection with construction evaluated projects on highway projects and technology application projects when undertaken.
- Working through the Office of Local Assistance and in cooperation with the FHWA, evaluate local agency implementation efforts.
- Keep FHWA informed of Caltrans and local agency implementation efforts and results.

6540 Responsibilities of Offices within Headquarters

Headquarters' offices are responsible for:

- Being responsive to requests of the Caltrans Technology Transfer Coordinator by reviewing Technology Transfer Packages.

- Accepting the responsibility of being an action office and reviewing and evaluating the submitted data for potential application to the Department and to plan and initiate the implementation effort.
- Advising the Caltrans Technology Transfer Coordinator of final action taken by the Department on packages assigned to that office for evaluation.
- Formulating recommendations concerning the methods to accomplish implementation in the Caltrans Implementation Plans and FHWA Technology Transfer items which have application by the Department.

6600 Implementing Program Peer Review

6610 Program Peer Review Definition

Program peer review is a method of evaluating a state's Research, Development and Technology Transfer (RD&T) program. It is an evaluation of these program areas: development, administration, delivery, and effective benefits. The review is carried out by participating states and the FHWA, in all of the states that use SP&R money. At least every three years, the state to be reviewed selects a review team of which at least two members must be on the FHWA list of qualified peer reviewers. The review is to assist in the identification and conveyance of successful practices and policies for managing the program.

6620 Performance Responsibility

When reviewed, California is responsible for selecting the peer review team. The team may consist of persons from other state highway research programs, university research programs, the FHWA Division, Region or Washington staff, AASHTO and/or TRB staff. Two team members must be on the FHWA list of qualified reviewers, maintained by the Associate Administrator for Research and Development.

The review team will prepare a report of its findings and submit it to the Caltrans Office of Pavement and Research Management. Caltrans will then forward a copy of that report to the FHWA Division Administrator with appropriate Caltrans annotations for the findings presented.

6630 Implementation of Review Results

The federal peer review process exists to assist states in developing successful research programs. It is not a compliance or performance dictating process. Applying constructive review comments from the peer reviews will make Caltrans' program more effective.

Application of the results of a federal peer review is not a mandatory edict to make all state programs uniform. Caltrans will be able to apply relevant results of the review in a manner that is consistent with the needs of the changing program.

There will also be FHWA compliance reviews for all state programs. They will be evaluating the state programs for effectiveness and to continue state certification. Caltrans will cooperate with the FHWA and participate in the federal review teams that look at other states' research programs, and implement relevant peer review strategies prior to compliance reviews.